

What is claimed is:

SUB B3) 1. A method of producing a bisubstrate inhibitor in a cell, comprising introducing into the cell an alkylating derivative of an acetyl acceptor substrate for an acetyltransferase present in the cell.

2. The method of claim 1, wherein the acetyltransferase is produced by the cell.

3. The method of claim 1, wherein the acetyltransferase is produced in a cell from an exogenous nucleic acid encoding the acetyltransferase.

4. The method of claim 1, wherein the alkylating derivative of the acetyl acceptor substrate is selected from the group consisting of a N-bromoacetylated acetyl acceptor substrate, a N-chloroacetylated acetyl acceptor substrate and a N-fluoroacetylated acetyl acceptor substrate.

SUB B4) 5. The method of claim 1, wherein the acetyltransferase is arylalkylamine N-acetyltransferase (AANAT) and the alkylating derivative of the acetyl acceptor substrate is selected from the group consisting of N-bromoacetyltryptamine, N-bromoacetylserotonin, N-bromoacetylphenylethylamine, N-bromo-acetyl-methoxytryptamine, N-bromoacetyltyramine, N-chloroacetyltryptamine, N-chloroacetylserotonin, N-chloroacetylphenylethylamine, N-chloro-acetyl-methoxytryptamine, N-chloroacetyltyramine, N-fluoroacetyltryptamine, N-fluoroacetylserotonin, N-fluoroacetylphenylethylamine, N-fluoro-acetyl-methoxytryptamine and N-fluoroacetyltyramine.

6. A method of inhibiting the activity of an acetyltransferase in a cell, comprising introducing into the cell an alkylating derivative of an acetyl acceptor

SUB BY  
CONT

substrate for an acetyltransferase present in the cell under conditions whereby a bisubstrate inhibitor will be produced, thereby inhibiting the activity of the acetyltransferase in the cell.

7. The method of claim 6, wherein the acetyltransferase is produced by the cell.

8. The method of claim 6, wherein the acetyltransferase is produced in a cell from an exogenous nucleic acid encoding the acetyltransferase.

9. The method of claim 6, wherein the alkylating derivative of the acetyl acceptor substrate is selected from the group consisting of a N-bromoacetylated acetyl acceptor substrate, a N-chloroacetylated acetyl acceptor substrate and a fluoroacetylated acetyl acceptor substrate.

10. The method of claim 6, wherein the acetyltransferase is arylalkylamine N-acetyltransferase (AANAT) and the alkylating derivative of the acetyl acceptor substrate is selected from the group consisting of N-bromoacetyltryptamine, N-bromoacetylserotonin, N-bromoacetylphenylethylamine, N-bromo-acetyl-methoxytryptamine, N-bromoacetyltyramine, N-chloroacetyltryptamine, N-chloroacetylserotonin, N-chloroacetylphenylethylamine, N-chloro-acetyl-methoxytryptamine, N-chloroacetyltyramine, N-fluoroacetyltryptamine, N-fluoroacetylserotonin, N-fluoroacetylphenylethylamine, N-fluoro-acetyl-methoxytryptamine and N-fluoroacetyltyramine.

SUBS

11. A method of inhibiting melatonin production in a cell which produces melatonin, comprising introducing into the cell an alkylating derivative of the acetyl acceptor substrate of AANAT which is selected from the group consisting of N-bromoacetyltryptamine, N-bromoacetylserotonin, N-bromoacetylphenylethylamine, N-

SUBS  
 COM

bromo-acetyl-methoxytryptamine, N-bromoacetyltyramine, N-chloroacetyltryptamine, N-chloroacetylserotonin, N-chloroacetylphenylethylamine, N-chloro-acetyl-methoxytryptamine, N-chloroacetyltyramine, N-fluoroacetyltryptamine, N-fluoroacetylserotonin, N-fluoroacetylphenylethylamine, N-fluoro-acetyl-methoxytryptamine and N-fluoroacetyltyramine.

12. A method of increasing the amount of serotonin in a cell which produces serotonin, comprising introducing into the cell an alkylating derivative of the acetyl acceptor substrate of AANAT which is selected from the group consisting of N-bromoacetyltryptamine, N-bromoacetylserotonin, N-bromoacetylphenylethylamine, N-bromo-acetyl-methoxytryptamine, N-bromoacetyltyramine, N-chloroacetyltryptamine, N-chloroacetylserotonin, N-chloroacetylphenylethylamine, N-chloro-acetyl-methoxytryptamine, N-chloroacetyltyramine, N-fluoroacetyltryptamine, N-fluoroacetylserotonin, N-fluoroacetylphenylethylamine, N-fluoro-acetyl-methoxytryptamine and N-fluoroacetyltyramine.

13. A method of treating a subject for a disorder caused by a decreased amount of serotonin, comprising administering to the subject an alkylating derivative of the acetyl acceptor substrate of AANAT which is selected from the group consisting of N-bromoacetyltryptamine, N-bromoacetylserotonin, N-bromoacetylphenylethylamine, N-bromo-acetyl-methoxytryptamine, N-bromoacetyltyramine, N-chloroacetyltryptamine, N-chloroacetylserotonin, N-chloroacetylphenylethylamine, N-chloro-acetyl-methoxytryptamine, N-chloroacetyltyramine, N-fluoroacetyltryptamine, N-fluoroacetylserotonin, N-fluoroacetylphenylethylamine, N-fluoro-acetyl-methoxytryptamine and N-fluoroacetyltyramine.

14. The method of claim 13 wherein the disorder is selected from the group consisting of depression, obsessive compulsive disorder, schizophrenia, mania,

sleep/wake disorder, panic attack, migraine headache, cluster headache, insomnia, bipolar disease and attention disorder.

SUB B6) 15. A cell comprising a bisubstrate inhibitor, wherein the bisubstrate inhibitor comprises an alkylating derivative of an acetyl acceptor substrate for an acetyltransferase present in the cell and CoA.

16. The cell of claim 15, wherein the acetyltransferase is produced by the cell.

SUB B7) 17. The method of claim 15, wherein the acetyltransferase is produced in the cell from an exogenous nucleic acid encoding the acetyltransferase.

18. The cell of claim 15, wherein the alkylating derivative of the acetyl acceptor substrate is selected from the group consisting of a N-bromoacetylated acetyl acceptor substrate, a N-chloroacetylated acetyl acceptor substrate and a N-fluoroacetylated acetyl acceptor substrate.

SUB B8) 19. The cell of claim 15, wherein the acetyltransferase is arylalkylamine N-acetyltransferase (AANAT) and the alkylating derivative of the acetyl acceptor substrate is selected from the group consisting of N-bromoacetyltryptamine, N-bromoacetylserotonin, N-bromoacetylphenylethylamine, N-bromo-acetyl-methoxytryptamine, N-bromoacetyltyramine, N-chloroacetyltryptamine, N-chloroacetylserotonin, N-chloroacetylphenylethylamine, N-chloro-acetyl-methoxytryptamine, N-chloroacetyltyramine, N-fluoroacetyltryptamine, N-fluoroacetylserotonin, N-fluoroacetylphenylethylamine, N-fluoro-acetyl-methoxytryptamine and N-fluoroacetyltyramine.

20. The cell of claim 19, wherein the cell is selected from the group consisting of a pineal gland cell and a retinal cell.